A

LETTER

TO A

PHYSICIAN

CONCERNING

Acid and Alkali.

Being an Anſwer to a late Piece, Intituled, *A Dialogue between* ALKALI *and* ACID.

Μωμήσεταί τις μᾶλλον ἢ μιμήσεται. Διογ.
Non ſoles reſpicere te, cum dicas injuſte alteri?
Plaut. in Pſeud.

By a Gentleman.

LONDON
Printed for *Andrew Bell* at the Croſs-Keys and Bible in *Cornhil.* 1700.

Aa.

A LETTER TO A PHYSICIAN CONCERNING *ACID* and *ALKALI.*

SIR,

THE Ambition I have of a more frequent epiſtolary Converſation with you, and my Zeal for your Service, have at laſt overcome the averſion I had to a review of thoſe pieces which have been written againſt the New *Hypotheſis* of *Acids.* For at my firſt reading I diſcovered ſo much unbecoming Language, that had not your Requeſt (which with me has always the Force and Virtue of a Command) chang'd my reſolution, I had never condemn'd my ſelf to a ſecond reading this

Dialogue, much less to the writing Remarks on it.

Upon this account I have forborn to take notice of the first twenty Pages, concluding, that as undecent personal Reflections are no marks of Probity and Virtue, so they are below the cognisance of a generous mind.

γλῶσσα βλάσφημος διανοίας κακῆς ἔλεγχος.

I confess I am amazed to see the Ingenious Author of the *Hypothesis* of *Acids*, treated with the utmost Contempt and Scorn, without so much as one *Author's* examining the truth of his *Hypothesis* by Reason and Experience. I think it becomes men of Letters, *Gentlemen* and *Philosophers*, as *Physicians* are, to weigh and consider the force of every man's reasoning, and not with unmanly reflections to condemn a *Doctrine* which they will not take pains to examine in any other way than a Jest: as if the Life and Health of mankind were a Trifle to be play'd upon in a Satyr.

Poetry is indeed a very pretty thing: but I must agree with you that the Character of a *Satyrist* and a *Physician* are vastly different; and as for those *Gentlemen* who value themselves upon a *Sarcastical couplet* press'd against its will to affront a *Professor* of *Physick*, I must esteem them as a more *Genteel* sort of *Mountebanks*; for altho there be a little more Wit and fine Language in those

Gen-

Gentlemens Satyrical Bills distributed by the *Bookſellers*, than in the dull *Grimace* of a Market ſtage, yet the nature, deſign, and effect of the *Farce* is the ſame: for Diſeaſes not being to be cured with a *Jeſt*, the *Patient*, who is taken with theſe witty recommendations, is at once bubbled of his Mony and his Health: and for his remedy ſhall have the Honour to be diſtinguiſhed in the next *Lampoon*.

But for my part, I ſhall never truſt my Life in the hands of a *Phyſician*, who takes ſo much pains with his Pen, to convince the world that he is a rare *Poet*, till by a demonſtration he proves that a *Correct Canto* will cure a diſeaſe.

Sir, I muſt obſerve that the *Author* of the *Dialogue* has not given one Experiment, or laid down the proceſs of any one Medicine he would recommend to the world, for the good of Mankind, or that might overthrow the *Hypotheſis* of *Acids*; tho he could not but be ſenſible that Dr. *Colebatch* had honourably and fairly offer'd his Method of practice to the Critical Obſervation of the Learned. I have therefore confirmed my Arguments with a variety of Experiments, to which I could have added a far greater Number; but I reſerve them, that if this *Author*, or any for him, think fit to give Anſwer, they may be produced for your Service.

In

In the mean time having reſolved to paſs over the firſt twenty Pages for the Reaſons intimated already, I proceed to conſider our *Author's* Arguments whereby he endeavours to defend *Alkali* as not being the cauſe of Diſeaſes.

And this he does by intimating, that *Alkali* cannot be the cauſe of Diſeaſes, for that other cauſes, that are not *Alkali's*, may be aſſign'd; and inſtances in the τὸ ἔνορμον, which he defines, to be *the Soul or Mind of man in its exorbitant Appetites.* It concerns not me to examine this definition, for if I take it for granted, it no way militates againſt the *Hypotheſis* of *Acids*; for, when we ſpeak of the cauſe of a Diſeaſe, which *Phyſicians* are ſaid to diſcover, and by Medicines to remove, we always ſuppoſe the *Proximate Cauſe*, which this τὸ ἔνορμον never can be: as I ſhall by and by evince, after I have taken notice of ſome other things which this *Author* aſſigns as the cauſe of a Diſeaſe; *viz.* the undue Conformation of the ſolid parts, as being too hard, or too ſoft, too little, or too great, too narrow, or too wide in proportion to one another: from which, he ſays, divers Diſeaſes, on divers occaſions, may proceed, and inſtances a large diſproportionate Liver, ſmall Lungs, narrow Veins, *Cartaliginous Aorta*, ſingle Kidney, *&c.*

To

To which I anſwer, that the undue conformation of the ſolid parts is no Diſeaſe, ſo long as they retain their due firmneſs of texture; nor can be ſuppoſed the cauſe of any Diſeaſe, when they perform their peculiar Offices of Secretion, *&c.* For, ſuppoſing the Organs of Hearing, Seeing, Smelling and Taſting, be diſproportionate as to ſize or ſhape, they are not called Diſeaſes; nor do I know what Diſtemper they can produce: did you ever know any Diſtemper cauſed in a Stag, from a *Cartilaginous Aorta*, which is that *Phyſicians* call the bone of a Stag's Heart? Nor can he aſſert that ever any man was diſeaſed, or died becauſe of narrow Veins, or ſmall Lungs: 'tis true, that Pain is often produced from the capillary Veſſels of the Brain, and other parts, being too much diſtended by a violent ebullition of the Blood: but no reaſonable man would ever aſſign the cauſe of that Pain to proceed from the narrowneſs of the Veins, for Perſons who have very large Veſſels ſuffer the like pains.

I have often obſerved in the diſſecting of Bodies, who have had one of their Kidneys obſtructed by Stones, Gravels or ſchirrous Tumors, and Ulcers, that the ſound Kidney and Ureter hath been enlarged conſiderably by the great influx of Urine, and hath performed the Office peculiar to both. But

to

to prove that the diſtempered Kidney in ſuch caſes is cauſed by an *Alkali*, I need only adviſe you to examine the Stones, Gravel, *&c.* taken from thence, which upon trial will exhibit the *Phaenomena* you can expect from moſt fixt *Alkalies*.

A large Liver is no more a Diſeaſe than a large Noſe, but rather of excellent uſe; for the Liver is deſign'd to ſecrete the *Bile*, that moſt pernicious excrement of our Bodies: ſo that according to the rules of proportion, the larger the Liver is, the greater quantity of Bile it will ſecrete, and the more we are benefited thereby.

But if he means a large Morbid Liver, I ſee no reaſon why he ſhould not grant it to be cauſed from a Superabundancy of Gall: for amongſt all the Animals that I have diſſected, who had their Livers diſtempered, I found them always ting'd with Gall: and among Butchers it's the common indication of a rotten Sheep, when the Liver is not of a florid complection, but ting'd with the bile: therefore if in ſuch Caſes there be a diſproportionate Liver, it muſt be from ſome *Heterogeneous* Particles of matter obſtructing the Juices in their Circulation through the Capillary Veſſels of the Liver; from whence it becomes inlarged in Magnitude: and this is frequently the effects of a Superabundancy of bile; for when the Liver is overcharged

ged with that Lixivious *Alkali*, the tone of its parts is thereby vitiated, and render'd incapable of aptly ſecreting that deſtructive Juice, and emitting it through its proper Emunctories.

Our *Author* tells us that Diſeaſes are cauſed from the Juices of our Bodies, being ſometimes too thick, or too thin: But I ſay it is from ſome Particles of matter admitted into the Blood, that is both the Cauſe of the Diſeaſe, and of the thickneſs or thinneſs of the Blood: for if there were not a retention of ſome Particles of matter which ought to be carried off, or an admiſſion of others that ſhould be prevented, the Blood would neither be too thick, nor too thin; but always have the ſame conſiſtency. And in *Phyſick* it may paſs for demonſtration, that if you find the Blood of a Perſon labouring under a Rheumatiſm, Scurvy, or Gout, to abound with *Alkali*, and be viſcous; and after he is cur'd by the uſe of proper *Acid* Medicines, you then find his Blood yield a leſs quantity of *Alkali* and be florid, and of a good conſiſtency; I ſay, it's to me a demonſtration that his Diſeaſe proceeded not from *Acids* but from *Alkalies*, which we found to ſuperabound while he labour'd under thoſe Pains, but evidently decreas'd upon recovery by the uſe of *Acids*.

That this is matter of fact, will appear to any man that will make the Experiment: and I dare affirm that he cannot produce me one Inſtance, of any Perſon's being cur'd of the foremention'd Diſtempers by the moſt Celebrated *Alkalies*. But to reaſſume the diſcourſe of the τὸ ἔνορμον. 'Tis apparent (ſays our Author) that the exorbitant Deſire or violent Action of the Will of Man, is that which often produceth ſuch effects in our Bodies, as when perceiv'd become a Diſeaſe: for by them the Blood is too much retarded in its Courſe, as well as the more ſubtil Liquors variouſly diſorder'd, and that theſe cannot in an inſtant produce a greater quantity of *Alkali* than the Body can bear.

He ſhould have told us what theſe exorbitant Deſires were, and what their Effects; whether the exorbitant Deſire of Mony, Women, Revenge, or Popular Applauſe: if he means ſuch, then I need not tell you what are their effects, for *Tyburn* gives undeniable Proofs that by them the Blood comes to be too much retarded in its Courſe, as well as the more ſubtil Liquors variouſly diſorder'd.

But if by produce, he means create any Particles of new matter which were not preexiſtent in the Blood and Juices, I know no man that will affirm ſuch an abſurdity as the immediate Production of *Alkali* by the operation

operation of the Mind. A diſappointment of the Will I know will of a ſudden cauſe a relaxation of the whole *Syſtema Nervoſum*, whereby Perſpiration with all the other Secretions are obſtructed, and the Organs of Reſpiration prevented from performing their Office; which accidents are often obſerv'd to attend Women: and by ſuch a relaxation of the *Nerves*, and Conſtipation of the *Pores*, there are frequently induc'd *Convulſions*, and *Hyſterical* Indiſpoſitions: and theſe Symptoms are produc'd no otherwiſe from a diſappointment of the Will, than as it is an antecedent Cauſe, which Medicine does not remove; but only concerns it ſelf about the immediate cauſe, the *Materia ex qua conſtat*, to wit, the Blood and Juices being imbu'd too plentifully with malign Particles of matter, which I ſay are *Alkalies*, whoſe Secretion is by the aforeſaid accidents prevented, and the total Retention of which is alone ſufficient to produce the moſt diſmal Symtoms. And ſeeing no man denies, that a firmneſs of texture in the Nerves, and a free Perſpiration, with all the reſt of the Emunctories performing their Offices of Secretion, are indiſpenſably neceſſary for the preſervation of Health: I defy him to prove that Nature ever ſecretes any thing that will come under the denomination of an

Acid when in a ſtate of Health. A Morbid Body, when the Nerves are relaxed and the tone of the Parts vitiated, I know will ſometimes eject the moſt benign Juices, which ſhould conduce to the ſupport and preſervation of the Subject, as in *Scrophulous*, *Cancerous*, *Venereal*, and *Cachectical Bodies*, &c.

Page 22. He ſuppoſes there ſhould be *ten*, *or twenty parts of Alkali* in a ſound Man's Blood, to one of *Acid*; and from either of theſe Principles exceeding their proportion infers, that the *Acid* or the *Alkali* may be ſaid to abound: but ſo long as they keep up to that ſtandard, neither of theſe Principles can be ſuppoſed the cauſe of a Diſeaſe. From which I may naturally infer, that theſe or the like Proportions are conſtantly to be found in a ſtate of Health, and that when either of theſe Principles exceed ſuch meaſures, a diſorder in our Bodies of one kind or other muſt enſue.

I have for ſome years been in a ſtate of Health, and ſo according to this ſuppoſition my Blood muſt have then abounded with ſuch like proportions of *Acid* and *Alkali*; ſo that it behoves me to take care that whatſoever I eat or drink ſhould yield but one part of *Acid* to ten or twenty of *Alkali*. But on the contrary I have taken quite other meaſures, for within theſe laſt twelve Months

Months I have drank for many days at leaſt a Quart of Crab-Verjuice in twenty four Hours, which alone was ſufficient to impregnate my Blood with ſix times the quantity of *Acid* he is pleaſed to allow it: and you know there's conſiderable quantities of *Acid* to be obtain'd from *Bread*, *Wine*, *Oranges*, and *Lemons*, of all which I take no inconſiderable quantities; but inſtead of being in the leaſt diſorder'd by them, I find my ſelf more vegete and ſprightly: if at any time I want an Appetite, the eating of *Lemons*, or drinking ſome other proper *Acid* reſtores it. I could give you a multitude of Inſtances where *Gentlemen* have complained, that after the taking of ſuch Medicaments as their *Phyſicians* call'd *Alkalies*, their Diſtempers have been exaſperated, their Appetites pall'd, but by the uſe of *Acid* Medicines they have been wonderfully relieved in a very ſhort time; of the truth of which you may be inform'd by enquiring of a multitude of *Apothecaries* in this City.

Page 23. After our *Author* has given us ſome Experiments made with *Acids*, and *Alkalies*, mixt in Syrup of Violets, he aſſerts, that there may be *Acid* enough in the Blood to cauſe a Diſeaſe, tho it will not turn the Syrup ~~green~~ red; but he has not prov'd it.

From

From the beginning of the 24*th* Page of his Dialogue to the 29*th*, there's nothing but Scurrility, and Quotations out of *Etmuller*, *Hoffman*, *Helmont* and *Hypocrates*; ſo that the ſtrength of his Arguments depends altogether upon an *ipſe dixit*.

Page 29. He ſays he is certain that *Acids*, as *Oil* of *Vitriol*, *Spirit* of *Nitre*, *Oil* of *Sulphur*, *&c.* coagulate and thicken the Blood, but very fallaciouſly teaches a wrong way of trying the Experiment: his directions are, to mix a little of either of the abovementi-on'd *Acids* with a little of the Blood, or Serum; by the which I underſtand he made his Experiments on Blood that had ſtood ſome time in the Porenger, when the grumous part was coagulated, and a Separation made of the Serum: a very irrational way of trying the Experiment, when the queſtion is whether an *Acid* when taken inwardly, and diluted in a proper Vehicle, will coagulate Blood when it's warm, *fluid*, and perpetually circulating through its Channels, by which means there's made a due Commixture of all its parts with whatever is ingeſted.

But to convince you that *Acids* will not coagulate Blood when judiciouſly uſed, Take 4 or 5 Drops of *Oil* of *Vitriol* or *Spirit* of *Nitre*, and dilute it in 3 or 4 Spoonfuls of Water; ſuch a proportion of *Acid* is as much

much or more, than can be admitted into the Blood at any time when taken inwardly: when you have opened a Vein, begin to drop your *Acid* Mixture into the Porenger, proportionable to the Stream of Blood; at the ſame time begin nimbly to agitate their parts with a Gooſe Quill, or the like, continuing the motion of your Feather till the Blood is cold. By this Method I have with *Oil* of *Vitriol*, *Spirit* of *Nitre*, &c. not only preſerv'd Blood fluid, but alſo free from Putrefaction, the laſt of which is what neither Volatile nor fixt *Alkalies* will do, as may be ſeen by the following Experiments.

Experiment I.

January 9th, I mixt with one parcel of Blood taken from a Woman who then laboured under a Pain in her Head, and right ſide about the region of the *Liver*, 6 Drops of *Oil* of *Vitriol* diluted in two Ounces of Water; and it not only preſerv'd the Blood fluid, but gave it a much better Colour and Conſiſtency than ſome of the ſame Blood had, with which I mixed nothing. I then put it into a Viol, and after having kept it by me about 18 days, I pulled out the Cork, and it was equally free from any Smell or ſigns of Putrefaction as when it ſtreamed from the Vein: the quantity of Blood made

made use of in this Experiment was about 5 or 6 Ounces.

Experiment II.

With a like proportion of the same Woman's Blood, I mixed 30 drops of *Oil* of *Tartar* (which you know is a fixt *Alkali*) diluted in two Ounces of Water, and the Blood seemed to remain fluid while it stood in the Porenger; but after I had poured it into a Viol, and suffered it to stand close stopt for 3 or 4 days, I observ'd that the grumous part thereof was precipitated, and it stunk most intolerably: the Smell was much like that proceeding from a dead Body, whose *Lungs* or other *Viscera* have been ulcerated, and too long expos'd in the Air.

Experiment III.

I also mixed with a like quantity of the same Woman's Blood, twenty Drops of *Spirit* of *Nitre dulcifi'd*, diluted in two Ounces of fair Water, and it preserved the Blood fluid, gave it a better Colour, and hindered any of its parts from subsiding; neither did it stink in the least, so long as I kept it by me, which was about 28 or 30 days.

Expe-

Experiment IV.

After the ſame Method I mix'd with four Ounces of the ſaid Perſon's Blood, 30 Drops of *Spirit* of *Sal Armoniac* which is an *Alkali*, and it preſerv'd the Blood fluid; but after ſeven or eight days keeping I open'd the Viol in which it was cloſe ſtop'd, and it ſent forth a very offenſive ſtink.

Sir, if theſe Experiments are not ſufficient to convince you of the falſhood of our Author's Aſſertion, *viz.* that *Acids* cauſe a putrefaction in animal Subſtances, I have a variety of others at your ſervice.

Page 30. He begins to argue *à juvantibus & lædentibus*, and ſays, that *Acids* are pernicious in *Hypochondriack*, *Hyſterical* and *Scorbutical* Caſes, in divers kinds of Ulcers, and Iſſues; and on the contrary, that theſe are reliev'd and eaſed by *Alkalies*. But we have only his bare word for't, for he hath prov'd neither; and ſhould I undertake effectually to prove that *Acids* are the only Medicines which cure thoſe Diſeaſes he has nam'd, it muſt be by enumerating Obſervations of Cures perform'd by them; which wou'd, I am afraid, make this Epiſtle too long. Therefore I ſhall only trouble you with the naming ſome of the moſt celebrated Medicines in uſe in the

cure of thoſe Diſtempers, as *Steel* in all its beſt Preparations, all the *Acid Spirits* and *Elixirs*, *Crem. Tart. Tart. Vitriolat. Sal Succ. &c.* all which in your practice you are very well acquainted with; and I refer you to what Dr. *Colebatch* hath ſaid on that Subject in his Treatiſes already publiſhed.

In the ſame page he ſays, that from Blood or Urine, of either healthy or diſeaſed Perſons, an *Acid* is to be obtain'd; but having not told us the Proceſs, I muſt beg his pardon if I don't believe him.

Again, he ſays that he can mix an *Alkali* and an *Acid* ſo, that in diſtillation there ſhall come over no *Acid*, but an *Alkalious* Liquor; and that he can mix an *Alkali* and an *Acid*, and there ſhall be neither an *Alkali* nor an *Acid* obtain'd from them, but a *Salſum*.

Again, he ſays that he can mix an *Acid* with an *Alkali*, and the reſult of the Experiment ſhall be, that neither an *Alkali*, *Acid*, nor *Salſum*, ſhall be obtain'd from them; but like a cunning Man, he will not ſhow us how theſe Tricks of *Legerdemain* are to be perform'd, leſt we ſhould diſcover the Impoſture.

Page 31. The natural or artificial Conjunction of an *Acid* and an *Alkali*, he ſays will make a *Salſum*; but I call it an *Acid*,

Acid, becauſe the *Acid* is moſt predominant, and does operate as ſuch: for if you take good *Tart. vitriolat.* which he calls a *Salſum*, and diſſolve it in Water, this Solution ſhall work upon Filings of Steel as manifeſtly as Spirit of *Vitriol* which is allow'd to be an *Acid*.

The Blood he ſays appears Salt to the taſte, which he calls a *Salſum*: but it's plain to him who will taſte Blood, that the Salt taſte thereof hath no Analogy to the Mixture of an *Acid* with an *Alkali*, no more than the mixture of Juice of *Lemons* and Salt of *Wood*, the one an *Acid* and the other an *Alkali*, hath with *Oil* of *Tartar*, or any other manifeſt *Alkali*.

Seamens being troubled with the *Scurvy* he aſſigns to proceed from their eating Fleſh and Fiſh too much ſalted, whereby the Spirituous and Volatile parts are too much exhal'd; and that common Salt acts not as an *Acid*, but as a *Salſum*.

I anſwer, that common Salt by often diſſolving and chryſtalizing ſhall be ſo much deprived of its *Bittern*, as to act as an *Acid*, by diſſolving Filings of ſteel, and making an ebullition with *Alkalies*, &c. or if you would do it at once, pour one ounce of *Spirit* of *Salt* into two Quarts of a ſtrong Solution of common *Salt*, then evaporate and chryſtalize; and ſo you will have the Salt

of a finer and larger Grain, and much more wholeſom and uſeful in all Caſes. The reaſon of which I take to be this, that the *acid Spirit* of *Salt* does correct the *Bittern* that is in all common Salt. When that is done, it ſhall remain of a cloſer Texture, not apt to run into Liquor; but one pound thereof ſhall ſerve and do as much as four of the common Salt, as I have known my ſelf.

Now Sea Salt being prov'd an *Acid*, I cannot imagine how it ſhould be the Cauſe of the *Scurvy*, when there's ſcarce a better Medicine known for its Cure than *Spirit* of *Salt*. And a *Scurvy* being the Symptom of a Putrefaction in ſome degree of the Juices of our Bodies, it will ſtill look more like a *Paradox*, that *Salt*, which is the known Preſervative of dead Fleſh, ſhould be the Cauſe of Putrefaction in that which is alive: Nor will the want of the ſpirituous and volatile parts of Fleſh and Fiſh, appear to be the cauſe of any Diſeaſe, when you conſider that *Phyſicians* commonly preſcribe their *venereal Patients*, &c. Fleſh roaſted or boiled to dryneſs, and ſuch other Food as yield the leaſt quantities of ſpirituous and volatil *alkalious* Parts, as Watergruel, dry Bisket, and Raiſins, *&c.* Now if I did not deſign brevity, I could produce ſeveral Inſtances to prove, that *Acids* are not the Cauſe

of

of the *Scurvy*, but that they are the only ſalubrious Medicines in uſe againſt that Diſtemper. Particularly in a worthy *Gentleman*, who for many years had been extremely afflicted with the *Scurvy*; but after the ineffectual uſe of many Medicines preſcribed by *Phyſicians* of the beſt Reputation, was at laſt, as he told me, prevail'd upon, by reading Dr. *Colebatch's* Tracts, to eat *Lemons* plentifully, and he quickly arriv'd to the Perfection of eating 30 in a day. By which Method he recover'd, and enjoys a perfect ſtate of Health. The *Gentleman's* Name I have not mention'd, becauſe I had not the opportunity of asking his Conſent.

Another Aſſertion our Author makes without any Proof or Experiment given, is, That tho a coldneſs or moiſtneſs of the Air hinders Sweat, yet we perſpire more when we don't ſweat than when we do: which I apprehend thus, that we loſe more in weight when we ſit ſtill in the open Air and in a cold froſty Morning, than if we were ſweating in the *Bagnio*; which I ſay may be prov'd a Miſtake by a multitude of Experiments made at the *Hummums* and other Sweating-houſes, where it's plain, that we loſe more in weight by one hours ſweating than we do in four without it.

Sweating and Perſpiration I apprehend to differ only *ſecundum Majus & Minus*; they both

both are conſequents attending the open Pores of our Bodies, and therefore I think it would be ridiculous to imagine that a cold or moiſt Air opens the Pores to promote Perſpiration, and ſhuts them at the ſame time to prevent Sweating.

Our *Alkali* man confeſſes in the ſame Page that he cannot ſee how an *Acid* can be ſeparated from Sea Salt when in the Blood and other Juices of the Body; and in the next Page affirms, that *Acids* are found ſeparated in further receſſes than the Stomach and Guts, which I think cannot be, from Bodies more eaſily to be diſſolv'd than Sea Salt. Neither is there any other Separation requiſite to be made of Sea-Salt or any other Food ingeſted, but a diſſolution of their Texture, ſo that every Particle of them may be at liberty to exert themſelves; and ſuch a Separation of Salt is commonly made before *Deglutition*. Beſides, it's plain that Bones and ſuch like ſolid Subſtances are in a great meaſure diſſolv'd in the Stomachs of *Dogs*, *Oſtriches*, and other Creatures of a voracious Appetite.

Page 32. He ſays, *Acids* are found ſeparated in further receſſes than the Stomach and Guts: one Inſtance he gives is that of a Cancerous Breaſt, cut off by Mr. *Smith*, who was poyſon'd by taſting an *Acid* Liquor found therein, ſo as to be the occaſion of

of his death ſome Months after; and that it was ſo penetrating like *Aqua fortis*, that he could not waſh away the taſte thereof, as he affirm'd on his death-bed to the *Phyſician* who gave him the account.

Sir, a Man that's poiſon'd is commonly *delirious* on his death-bed; and it's not unuſual to hear ſuch in their *Phrenſy* accuſe the moſt proper Medicine of being the cauſe of their death. But ſuppoſing Mr. *Smith* was poiſon'd, it will follow, according to his own Aſſertion, that it was not done by an *Acid*, becauſe, ſays he, I cannot ſee how an *Acid Spirit* can be ſeparated from any thing while in the Blood. But granting that it was a ſtrong *Acid* like *Aqua fortis*, how will you account for its not making way through the Breaſt before Amputation? Again, had it been a ſtrong *Acid* like *Aqua fortis*, it could not fail of raiſing an *Eſcar* on Mr. *Smith*'s Tongue who taſted it, which had it done, it would then have been impoſſible for him to taſte the Liquor ſo long after, becauſe the mortified Fleſh wou'd have fill'd his Mouth with a ſtink far ſurpaſſing that of any *Acid* Liquor. I preſume, Sir, that the *Phyſician* who told him this Story, had the care of Mr. *Smith* during his Sickneſs, and without doubt fail'd not in exhibiting the moſt Celebrated *Alkalies*; but it appears they did him no ſervice, for which

which reaſon I believe the Liquor he taſted did not kill him without other help.

Page 33, 34. In the *Small-Pox*, *Scurvy*, and *Gout*, he ſays it may be reaſonably ſuppos'd, that the Blood of Perſons ſo diſeas'd yielding a greater quantity of *Alkali* than at other times, doth proceed from the *Acid* Particles being precipitated, and ſo fix'd in the extremities by their meeting with the *Alkaline*; ſo that the Blood flowing in the Veins, being depurated from the *Acid*, it muſt therefore yield a greater proportion of *Alkali*.

But this Suppoſition of his is eaſily overthrown, by Chymically analyzing thoſe Chalky Subſtances ſeparated from the Blood of Perſons afflicted with the *Gout*, and fixed in the Extremities, which you will find plainly to exhibit the *Phoenomena* peculiar to *Alkalies*.

He is alſo very kind in telling us what great difficulties attend the diſtillation of Blood, ſo as to be able to ſay, within a grain here's all the *Alkali*, or *Acid*, in ſo much Blood. But I know, tho 'tis difficult to give Judgment to a Grain in the diſtillation of Blood, yet the difference is ſo manifeſt between *Morbid* and *Sound* Blood, that threeſcore or more Grains may be allow'd for perſpiration through the *Lute*, deficiency of

of Fire, or the waſte in large Glaſſes, or the want of room in ſmall ones, when you make uſe of the ſame Method in diſtilling of both.

Page 35, 36, 37. The *Saliva* he ſays is not an *Acid*, becauſe it will turn *Syrup* of *Violets* green. Sir, this Experiment does not prove that the *Saliva* is not impregnated with a manifeſt *Acid*, which is what Dr. *Colebatch* aſſerts: for there are a multitude of other Bodies which will turn the *Syrup* green, yet have in them a manifeſt *Acid*, as *Oils* and *Vinous Spirits*, which tho they have in them a manifeſt *Acid*, yet it is ſo intangled or ſheathed in the other parts of the *Fluid*, that it cannot be unlocked or ſet at liberty, to exert it ſelf by ſo clammy a Body as *Syrups* of *Violets*, yet they operate on other Bodies by virtue of their *Acid*. So *Oil* of *Turpentine* will diſſolve *Copper*; and it's the *Acid* that is in *Sulphur*, that makes the *Mercury* ſo eaſily embody with it by rubbing, as in *Ethiops Mineral*, and ſo likewiſe in *Turpentine*, *Spittle*, &c. and becauſe he ſays it's from the *Turpentine* conſiſting of ramous and flexible parts, which I think is the ſame thing with ſaying they conſiſt of nothing at all; for till he ſhews me thoſe ramous and flexible parts, I muſt believe it is from the *Acid* that is in them that they embody with *Mercury*. Again, the *Saliva*, &c. receive

their Denominations of *Acid*, not from quantity, but quality; for were they diveſted of that which gives them the name of *Acids*, they would fail in anſwering thoſe intentions which with it they perform. As for the inſipid *Calxes* that kill *Mercury*, I believe it falſe, till he tells me more of it; for there is none that I know of will embody with *Mercury*, and hold it ſo long as *Saline* or *Acid* Bodies will.

The Trial he made on *Saliva*, was on that taken from ſound Perſons that often eat and drink *Acid* things; by which I underſtand that their frequent uſing of *Acids* did not impair their Health: and in the diſtillation thereof he found a *Sal Salſum* in the *Caput Mort.* from which might be obtain'd a manifeſt *Acid*.

Blood, *Serum*, and other *Animal Subſtances* (ſays our Author) give an unpleaſant Smell when evaporated on the fire, but the *Saliva* will yield a grateful Savour. Sir, you know that *Nutmegs*, *Cinamon*, and all odoriferous Vegetables abound with *Acid* and *Sulphur*, from whence according to their different modifications proceed thoſe grateful Smells. Is it not then reaſonable to conclude that the pleaſant Smell ariſing from *Saliva* when evaporated, comes from an *Acid* or *Sulphur*? for all *Animal Subſtances*, when tending to corruption, emit a noxious Smell;

and

and from them in that ſtate you cannot find a *Salſum*, ſuch as he had from *Saliva*.

Now he ſays that there's no need of any *Acid* in the Stomach, and tells us that his Stomach is always beſt when there's not ſo much *Acid* in it as will curdle Milk. In anſwer to this I ſay, there may be an *Acid* in his Stomach, tho not ſo much as will curdle Milk: for a ſmall quantity of Wine, when poured ſlowly into Milk, will not curdle it; and you know that Wines have in them a manifeſt *Acid*. Nay, which is more, take a ſmall quantity of Vinegar diluted in Water, and pour it into Milk gently, and there will enſue no *Coagulum*. There are a great many Vegetables in whom *Acid* abounds, which when decocted in Milk will not coagulate it.

Page 40. He will not allow that the *Saliva* acts in the ſtomach as an *Acid*, notwithſtanding an *Acid* may be obtain'd from it. But to convince you that the *Saliva* does act as an *Acid*, I ſhall enquire what Juices are brought into the ſtomach to cauſe hunger, which may be known by conſidering what Veſſels communicate their Juices to that *Viſcera*. 'Tis plain that neither the *Veins* nor *Arteries* convey any of their Juices into the cavity of the Stomach, nor is it properly ſpeaking the *Lymphatick* Veſſels; neither can it be the Nerves, for I know

not that they have in them any ſuch quantities of Liquor. I conclude then that Hunger is cauſed by that Juice ſtrain'd from the *Salival Glands*, which is continually in a ſtate of Health more or leſs conveyed into the Stomach by the preſſure of the Muſcles: and you may obſerve that in Fevers, *&c.* where that moiſture is deficient, the Patient has no deſire for Food. Hunger is alſo caus'd by the eating *Lemons*, *Oranges*, and ſuch like *Acids*. Now if Hunger is caus'd only by *Acids*, I deſire him to prove what Juice is brought into the Stomach from any other part of the Body, that yields a greater quantity of *Acid* than *Saliva*.

He proceeds to deny the truth of two Cures that Dr. *Colebatch* tells us he perform'd on Perſons afflicted with the Stone; and argues againſt the opinion of there being ſome Veſſels paſſing from the bottom of the ſtomach to the Kidneys. I confeſs that in all the Bodies which I have diſſected I could never diſcover any ſuch Ducts, for which I aſſign this reaſon, that all Veſſels which have not in them a quantity of Liquor after death, and are not of a very firm Texture like the Blood-Veſſels or *Ureters*, are very difficult to be found or trac'd, becauſe they lie flat and appear like *Membranes*. But to corroborate the notion of there being ſome undiſcover'd *Cannulas* paſſing from the

the Stomach to the Kidneys, I ſhall from Authority give you the following Obſervations as circumſtantial Proofs.

Dr. *Havelin* of *Plimouth* gives an account of a Patient of his who was *Miniſter* of St. *Martins* 12 miles diſtant from thence, who having voided by *Urine* conſiderable quantities of Herbs that were mixt with his broths; and that he having given him ſome *Gummous* Pills, he alſo voided two of them through the *Urinary* Paſſages, which the *Doctor* had by him not long ſince.

In the *Philoſophical Tranſactions*, *Vol.* 2*d*, *Tract.* 4*th*, *Page* 803. Dr. *Fairfax* tells us of a Patient of his who voided a leaden Bullet through the *Urinary* Paſſages; and ſubjoins his opinion, that there are Veſſels which paſs from the bottom of the Stomach to the Kidneys.

A very ingenious *Gentleman* told me that Dr. *Mayow*'s elder Brother, who he ſays is a Man of great Veracity, aſſur'd him that he having uſed a *Bochet* in which Raiſins were boyl'd, the Liquor not being ſtrain'd when drank, he diſcharg'd two of them through the *Urethra*, tho with ſome difficulty.

But if you pleaſe to advert to *Dimerbrook's Anatomy*, you will there find the *Hiſtory* of ſeveral Perſons piſſing *Needles*, *Alkekengi*, *Mellon Seeds*, and other ſolid Subſtances: beſides, I have obſerv'd that in

10 or 20 minutes after the eating of *Aſparagus*, or taking a few Drops of *Oil* of *Turpentine*, that the Urine has been highly perfum'd by them.

Now he endeavours to obviate this by ſaying, that Cows Milk will taſte of the *Crow Garlick*, and it will be very hardly got out of the Cheeſe made thereof: but this doth not at all derogate from the reaſonable opinion that there are ſome undiſcovered *Cannulas* paſſing from the Stomach to the Kidneys, becauſe from the Guts there are the *Venæ Lacteæ* which have immediate communication with the mamillary Glands, and help to compoſe them; by which means it is that if a Woman ſuffer a Child to ſuck Milk from her Breaſt that day wherein ſhe takes purging *Phyſick*, the Child ſhall be purged alſo.

Page 45, 46. The *Bile* he allows to be the moſt *alkalious* matter in the whole Body; and the *Dung*, he ſays, yields a fixt *Salt*, like to that obtain'd from the *Gall*, which no other part of the Body doth: but urges, that the *Gall* is mixt with the *Chyle* to prevent any *Acid* from entring the maſs of Blood; that the *Gall* attempers the *Chyle*, and doth great ſervice, tho detain'd in the Body; that there's not ſeen more evil effects from the *Gall's* retention in the Blood, than from its abſence in the Guts.

I anſwer, that the Dung affording a fixt *Salt* like to that obtain'd from *Bile*, which he ſays no other part of the Body will do; and the *Chyle* not appearing ting'd with greenneſs, nor Milk yielding any ſuch fixt *Salt*, which it certainly would if the *Bile* were mixt therewith, are plain Indications that the *Gall* is carried down with the reſt of the Excrements, but not mix'd with the *Chyle*. Neither will it appear reaſonable to imagine that the *Gall* ſhould be carried into the *Venæ Lacteæ*, when you conſider how narrow thoſe Veſſels are, and how thick the *Bile* is, eſpecially when mixt with an *Acid*.

The *Gall's* preſence in the Guts can be of no other uſe than that it's in a way of being ejected by ſtool; and if it be detain'd in the Guts, the conſequences are very diſmal, as violent *Colick* pains, an *Iliaca paſſio*: but if any quantities of it paſs downwards, a *Diarrhea* enſues, which if too ſoon ſtopt, will not fail endangering the Patient's Life. When the *Bile* is brought into the Stomach by an inverted motion of the Guts, produc'd by its *Lixivial* Particles vellicating their Fibres, then corroſive Pains in that *Viſcera* enſue, with enormous vomitings. It may be known that theſe Symptoms are produced from that Juice, by the Excrements being tinged therewith, or the Patient vomiting quantities thereof: and I always obſerve, that drink-

drinking large quantities of Water or Poſſet-drink when the *Gall* is lodg'd in the Stomach, cauſing pain, immediatly gives eaſe, after which they vomit; and according to the diſcharge of *Bile*, ſuch is their relief. If it ſtop in the *Liver*, it produces violent Pains therein, and ſometimes makes it *ſchirrous* and *ulcerate*, if it remains in the Blood. Various are the diſorders it produces, according to the place it affects, as the *Jaundice* violent Pains in the Head and Back, a depreſs'd Pulſe, an univerſal Languor, with a multitude of other Symptoms too tedious to enumerate.

I aſſiſted in the opening a *Gentleman's* Body, where was found the *Gall-Bladder* empty; one part of the Liver was ſchirrous and ulcerated: in the Brain we diſcover'd a Mortification under the left ſide of the *Os frontis*: both Lobes of his Lungs were ulcerated, and appear'd to be nothing elſe but a Maſs of rottenneſs. This *Gentleman* led a Sedentary Life, which with other Cauſes concurring, prevented the *Bile* from being carri'd into the Guts, and hinder'd the Liver from ſecreting it. His Friends told me that his firſt complaint was a pain in his right-ſide; this proceeded from the *Bile* remaining in the Capillary Veſſels of the Liver, whereby a regular Circulation of the Juices through that *Viſcera* was prevented,

and

and therefore it became *ſchirrous*, loſt its tone, and was diſabl'd from ſeparating the *Bile*, and at laſt ulcerated. The Liver thus ceaſing to perform its Office, the Gall regurgitated or continued in the maſs of Blood, and fix'd it ſelf on thoſe parts whoſe ſtrength was leaſt able to reſiſt it, as the *Brain* and *Lungs*, producing in them the foremention'd Symptoms: and I have frequently obſerv'd thoſe Bodies ſtink ſooneſt in whom the *Gall Bladder* was found empty; particularly that of a Child I lately open'd, who died complaining of a Pain in its Stomach and Guts. I found the Liver very much ting'd with *Bile* and by graſping the Stomach in my hand, I forc'd upwards about two Spoonfuls of the *Gall*, which diſcharg'd through the Noſtrils; for the Mouth being very cloſe ſhut, it could not diſcharge that way. I alſo found a ſmall quantity of *Bile* in the *Inteſtinum rectum*. All which I think were ſufficient Indications of the Child's death proceeding from a Superabundancy of *Gall* brought into the Stomach and Guts, the only parts of which it complain'd; and this Body ſtank intolerably.

But to convince you that *Acids* are admitted into the Blood, I ſhall put you in mind of the *Pancreatick Juice*, which is manifeſtly *Acid* to the taſte. Nay, *Chyle* taken from the *Venæ Lacteæ* of a Dog ſome hours after

he had been well fed, I have by taſting perceiv'd it manifeſtly *Acid*, when it has been kept ſome time. And you know it's from a diſtribution of the *Lacteal Juice*, that an increaſe and ſubſiſtence is given to all the parts of the Body.

So Milk, which is only a more elaborate *Chyle*, by long keeping turns ſour, not from its being expos'd to the Air; for if you put it in a Glaſs, and having exhauſted the Air, you ſeal it up *Hermetically*, it will notwithſtanding all your care become ſour. And how far a deprivation of that Juice is a cauſe of Leanneſs, may by common Experience be ſeen in wet Nurſes.

Thus, contrary to his aſſertion of the *Gall* being a ſtrict guard preventing any *Acid* from entring the Gariſon of our Bodies, I think it's prov'd that *Acids* ingeſted are admitted into the *Venæ Lacteæ* with the *Chyle*, and conſequently carried along with it into the maſs of Blood; without which it were impoſſible we could ſubſiſt, as may be ſeen by that Experiment mention'd in Dr. *Needham*'s Piece *de format. Fœt.* where he ſays that Dr. *Lower* having tore the receptacle of the *Chyle* in a Dog, and preſerv'd him alive, having ſtitch'd up the external Wound, the Dog, tho very well fed, died the fourth day, being ſtarv'd to death: and having open'd the Body, he found the *Chyle* in great quantity

tity lodg'd in that part of his Breaſt which was wounded.

Page 65. *Acids* are by him denyed to hinder Putrefaction in animal Subſtances, from *Oil* of *Vitriol*, or *Spirit* of *Nitre* pour'd on the red part of Blood, and turning it into a black Corruption, and the *Serum* into a white purulent matter: ſo *Bladder*, *Leather*, *Fleſh*, *Skins*, *Tendons*, he ſays, have their textures deſtroy'd by *Acids*.

I have already anſwer'd the firſt part of this Objection, and have told you this is a fallacious way of trying the Experiment: for tho *Oil* of *Vitriol* alone will coagulate Blood when it is cold, and a Separation made of its *grumous* parts from the *Serum*; yet if it be diluted in a proper quantity of an *aqueous Vehicle*, which is the method of giving ſuch ſtrong *Acids* internally, it will preſerve the Blood fluid, and free from Putrefaction.

I have preſerv'd an *Embrio* with two Ounces of *Spir. Nitri* diluted in a convenient quantity of Water, and its texture hath not in the leaſt been deſtroy'd thereby, but hath been free from any Smell or ſigns of Putrefaction: and retain'd a florid complection all over the Superficies. 'Tis the *Acid* of *Salt* which preſerves Fleſh and Fiſh from Putrefaction; for if you diveſt the *Salt* of its *Acid*, what remains will never do the buſineſs. *Vinegar* and *Salt* are the chief ingredients

gredients made uſe of in preſerving *Cucumbers*, *Capers*, *Walnuts*, *Kidney Beans*, &c.

Animals, ſays our *Author*, that yield half their weight of an *Acid* Liquor, putrefy ſooner than others that abound more with an *Alkali*. But he hath not told us what *Animals*; and if I grant what he ſays, it will not prove that their Putrefaction is caus'd by the great quantity of *Acid*, but from their deprivation of it: for when the *Animal* was alive, and had all its *Acid*, then there were no ſigns of Putrefaction in it; but being dead, and the *Acid* thereof gone off in *Effluvia*, there's no reaſon to wonder that the remaining Subſtances ſhould putrefy.

Page 66. Vegetables that yield moſt of an *Acid* and *Oil* in diſtillation, he tells us will rot ſooner than others; as *Crabs*, *Oranges* and *Lemons*, will rot ſooner than *Apples* that are not ſo ſour.

Sir, every years experience informs us how falſe this Aſſertion is; for *Lemons* are longer preſerv'd than *Apples*, and will not putrefy but when bruis'd: *Lemon*-peel is of uſe many years, if preſerv'd only by drying; but the skins of *Apples* will not keep ſo long. *Crabs* alſo I am told will preſerve longer than *Apples*, but if they rot ſooner, it's from the loſs of their *Acidity*; for when putrefy'd, they are no longer ſour. I have kept a *Vegetable*

getable two years in Water *acidulated* with *Spirit* of *Salt*, and it hath remain'd ſound and intire; but I defy him to ſhow me an *Alkali* either volatile or fixt, that will preſerve *Animals* or *Vegetables* from Putrefaction.

Page 67. *Allum* he aſſerts is not an *Acid*, notwithſtanding an *Acid Spirit* is to be obtain'd from it in great quantities; nor doth it operate as an *Acid*, becauſe, ſays he, it turns *Syrup* of *Violets* green. Again, he ſays, *Allum* is us'd in making of *Leather* on the account of its aſtringency, to make the Skins more compact. Sir, upon tryal I find it's the *Chalky* Subſtance in *Allum* which renders the *Syrup* green: for if you take the *Acid* Spirit, and mix it with *Syrup* of *Violets*, the *Syrup* will be turn'd red; and it's the *Acid* Particles of the *Allum* that make the Skins compact; for if you ſeparate the *Acid* parts of the *Allum* from the *Chalky* Subſtance, that remaining matter will be of no ſuch uſe.

His Query, how *Coffins* made of *Oak* and the moſt reſinous *Fir*, which have in them plenty of *Acid* and *Oil*, are conſum'd, when the *Bones* that abound with *Alkali* remain firm, I can eaſily anſwer: for it's plain that Rottenneſs is produc'd in them from the *Alkalious* Fleſh and Juices of the putrefying *Cadaver* they contain, emitting plentifully their *Effluvia*, which having no vent continue to undulate

undulate round the Confines of the *Coffin*, and by degrees entring the Pores of the wood produce in it rottenness. The reason why *Bones* corrupt not so soon as the *Coffins*, proceeds from the hardness of their *Cortex*, having smaller Pores than Wood, that will not so readily admit these *Alkalious Effluvia* to enter them. And I observe that *Bones* which have been long buried, are always more rotten than those preserv'd for *Skeletons*. *Oaks* and *Firs* are not so easily consum'd by lying in the Earth as he imagines; for in many places of *Scotland* there are every year dig'd out of the earth large *Oaks* and *Fir-trees*, which no man now living can remember ever grew, or were buried there: these *Firs* have not in them any signs of Putrefaction, but when dri'd are us'd by the Country People instead of *Candles*; and in burning they afford great quantities of a resinous Substance: but the Barks of these Trees are commonly rotten, for in them is to be found very little of an *Acid* or *Oil*.

Page 68. *Acids*, he says, are not the only things will allay thirst, for *Nitre* will do it. By Experience I know that if you take from *Nitre* what is *Acid*, the remaining Substances will not quench thirst; but the *Acid Spirit* given in a due proportion with a proper *Vehicle*, will do it much better than *Nitre* given in substance.

Oil

Oil of *Vitriol*, he ſays, is a noble Medicine in Fevers. I agree with him, and by experience I know it is ſo; but he ſays that he knows an *Alkali* that is better; I deſire he would produce it, otherwiſe I ſhall believe it to be an *Acid*.

I think it's not material whether the Experiments try'd on Dogs, by injecting into their Veins *Oil* of *Vitriol*, be true or falſe; for that's not the method of giving *Acids* I contend for, not that I queſtion, but if they were judiciouſly made, they would anſwer the Character thoſe *Gentlemen* have given of them.

Page 72, 73. He offers no reaſons againſt the giving of *Acids* in the *Small-Pox*, but ſays that he has given *Alkalies* with Succeſs, yet hath not told us what *Alkalies* they were.

Sir, the uſe of *Acids* in the *Small-Pox* is now ſo generally believ'd and practis'd, that I need not trouble you with Arguments from that *Topick*, eſpecially when I conſider that your own experience enables you to ſpeak more in their praiſe than I am able to do: however I ſhall ſubjoin the following ſtory, as it was told me by a *Chirurgion*, who formerly belong'd to the *Army*, and is a man of great veracity. He ſays that during the time which he quarter'd in *Portſmouth*, which is about five or ſix years ago, a multitude

titude of that *Regiment* to which he belong'd had the *Small-Pox*, and he gave them for their conſtant drink large quantities of *Spir. Vitrioli* diluted in fair Water, and edulcorated with *Syrup. Garyophillorum*; and the Succeſs he had was generally taken notice of throughout the Gariſon: for tho in another Regiment that quarter'd in the ſame Town, and had no greater numbers of Men ſick than he had, they ſeldom fail'd of burying twelve or fourteen men every week, yet in their Regiment there did not die one man in ſix or ſeven weeks time: but he confeſs'd to me not to have us'd *Acids* then, for the reaſons that he does now; he ſays he knew that *Acids* would quench thirſt, but never imagin'd they would cure a Diſeaſe.

The *Alkali* in the Blood, our Author ſays, cannot be put into a hurry alone, nor when mixt with the ſmalleſt quantity of *Acid*; but more *Acid* added produces a greater heat.

I anſwer, that a mere *Acid* given in great quantity will not produce a greater heat in our Blood, as may be ſeen in the exhibition of *Oil* of *Vitriol* to Perſons in Fevers, or in the mixing *Volatile Salt* of *Hartſhorn*, or *Sal Armoniac*, which are *Alkalies*, with *Spirit* of *Vitriol* an *Acid* which makes a coldneſs, but I will not ſay ſo of *Sulphureous Acids*.

Page 81. The *Chalky* Subſtance generated in fits of the Gout, he ſays, will not prove the Diſeaſe to be caus'd by *Alkalies*: for, ſays our *Author*, *Alkalious Salts* when in ſolution are not coagulated alone, but by meeting with *Acids*. I ſay that *Alkalious Salts* when in ſolution, are coagulated with what he calls *Alkalies*: for *Spirit* of *Hartſhorn*, or *Spirit* of *Sal Armoniac* made with *Salt* of *Tartar*, or any other volatile *Alkali*, will embody with *Copper*, and make what is call'd *Salt* of *Vitriol*, if they are ſuffer'd to ſtand together in the cold for a Month. And the ſame *Spirit* of *Sal Armoniac*, &c. which he allows to be an *Alkali* in ſolution, will in diſtillation ſo intimately unite it ſelf with *Lime*, which is a fixt *Alkali*, that he ſhall never be able to ſeparate any *volatile Alkali Salt* from it again. Indeed it may have the Smell of a *volatile Alkali*, but there's no *volatile Alkali Salt* to be got from it, as may be ſeen; for if the aforeſaid *Spirit* be three or four times diſtill'd from good *Lime*, it ſhall be ſo far from what we call an *Alkali*, that it ſhall make no ebullition with a manifeſt *Acid*.

Page 82. He denies that the *Offa Alba* is a Coagulation of the *Vinous Spirit* with the *Urinous Salt*; but ſays, that it is a precipitation of the *Urinous Salt* out of its *Flegm* by the effuſion of the *Vinous Spirit*. I muſt tell

you, that this *Gentleman* groſly miſtakes what *Offa Alba* is. 'Tis no precipitation of the *Salt*, but a *Coagulum* of the *Vinous* and *Urinous Liquor* into one Body: for it's as much in a *Coagulum* at top as at bottom, and the top has as much Salt in it as the bottom; and if he lets it ſtand for ſome little time, it will be reduc'd into one intire *Liquor*.

Page 83. He ſays we cannot drink *Vinous Spirits* ſtrong enough to coagulate the *Alkalious Spirit*. What will he think of ſome that I have ſeen drink high rectifi'd *Spirit* of *Wine*? and he allows that high rectifi'd *Spirit* of *Wine* will precipitate *Alkalious Salts*. If the aforeſaid *volatile Spirits* are diſtill'd from *Teſtaceous Powders*, ſuch as calcin'd *Oyſter-ſhells*, *Cockle-ſhells*, &c. the *Alkali Volatile Salt* will be deſtroy'd.

Moreover, ſays our *Author*, this *Offa Alba* is ſo very *ſubtil* and *volatile*, that it would eaſily find paſſage, and be carried off through the Pores by a gentle heat, and be ſo far from coagulating into a *Chalky* Subſtance, that it is a good Medicine to thin the Blood. The Salt of this thing, which he calls *Offa Alba*, will, if you try it, fix it ſelf with common *Lime*, *Oyſter-ſhells*, &c.

P. 89. *Iron* is not an *Acid*, he ſays, becauſe it blunts and abſorbs *Acids*, making an effervescence with them, and is diſſolv'd by them. But I anſwer, *Iron* making an effervescence with

with an *Acid*, is no more an Argument that it is an *Alkali*, than that *Butter* of *Antimony* (which is allow'd to be a ſtrong *Acid*) is an *Alkali*, becauſe it makes a violent effervescence with *Spirit* of *Nitre*, or *Spirit* of *Vitriol*, which are *Acids*. Neither is *Iron* properly an abſorber of *Acids*, but of *Salts* in general: for if you pleaſe to try, it will be diſſolv'd by *Acid*, *Alkali*, or what he calls *Sal Neutrum*. If you put upon filings of *Iron* a *volatile Alkali*, ſuch as *Spirit* of *Urine*, *Spirit* of *Sal Armoniac*, or *Hartſhorn*, &c. there will a gentle ebullition enſue: if it ſtand in the cold (for in the heat the *Alkali* will ſoon be driven away) and this will laſt for a day or two, then you'll find the *Spirit* to be impregnated with the *Steel*, tho it is but little. And *Crem. Tart. Tart. Vitriolat.* Common *Salt* will diſſolve *Steel*, as may be ſeen in ſeveral Preparations of *Tart.* and *Steel* to be had in the *Chymiſts* ſhops. From whence may be inferr'd, that *Steel* is not properly an abſorber of *Acids*: And ſo likewiſe of other *Metals*; for they will be diſſolv'd by ſome Salts, ſome very eaſily, ſuch as *Copper*, and others with trouble, if the operation be perform'd by the unskilful.

But to go a little further in the matter, and do ſomething towards proving that *Steel* abounds with *Acid* and *Sulphureous Particles*, which is what he denies, and not

with *Alkalious*, and ſo conſequently ought to be call'd an *Acid*: I ſhall firſt ſhow that *Iron* or *Steel* (for I ſhall uſe the words promiſcuouſly) is very much impregnated with *Sulphur*; and then prove, contrary to his Aſſertion, that there is a burning *Brimſtone* to be obtain'd from it. 'Tis a common Obſervation, that filings of *Steel* flung through the flame of a Candle, will take fire ſooner than *Gunpowder*, and as ſoon as common *Brimſtone*. The violent motion of the Flint and Steel, or two pieces of Steel together, does the ſame that the immediat flame of the Candle does with the filings.

When the filings of *Iron* are in diſſolution with *Spirit* of *Salt*, the fumes that ariſe out of the Glaſs will take fire; and if done in a convenient Glaſs, and a lighted Paper held to the Fumes cloſe to the neck of the Glaſs, it will take fire, and fulminate as loud as the noiſe of a Musket. I hope by this time the *Gentleman* may be ſatisfi'd that there is ſuch a thing as common *Brimſtone* in *Iron*: if not, I ſhall only deſire him to take a quantity of *Sal Martis*, and diſſolve it in common Water, then add a quantity of *Oil* of *Tartar* ſomewhat more than enough to precipitate the *Iron*; afterwards evaporate all this muddy Liquor to dryneſs, without ſeparating any thing of the precipitate from it; then flux what remains with

with a little *Charcoal* in a ſtrong fire, and he will have a very *Sulphureous Salt*; which if he diſſolves in Water, and filter it, he may precipitate from this Solution by the help of diſtill'd *Vinegar*, or *Spirit* of *Salt*, a *Sulphur* which will burn and ſtink like common *Brimſton*: or if *Tart. Vitriolat.* and filings of *Iron* be mixt together, and put into a ſtrong *Heſſian Retort*, and then into a naked fire, and continu'd there for twelve or ſixteen hours; what remains in the *Retort*, muſt be taken out, and diſſolv'd in Water, afterwards precipitated by the help of any of the abovemention'd *Acids*, the precipitate will be an inflammable *Sulphur*. I have not mention'd the proportion of *Tart. Vitriolat.* and filings of *Steel*, becauſe I am talking to a *Chymiſt*. If theſe Experiments will not ſuffice to prove that there is a *Sulphur* in *Iron*, I may chance to produce twenty more of different ſorts; but I ſuppoſe theſe will ſatisfy the reaſonable, and then I muſt conclude *Steel* to be rather an *Acid* than an *Alkali*, till I am convinc'd by matter of Fact that what is call'd a *poſitive Alkali*, may be obtain'd from it: And I hope no Perſon will doubt, that if I can get a *Sulphur* from *Steel*, but I may alſo get an *Acid* in quantity.

Page 91. Every rational Man, he ſays, will think *Acids* ſo far from being uſeful to cure

cure a Diſeaſe caus'd from too much *Acidity*, that he will account it no leſs than *Ignem oleo extinguere*, to uſe them in ſuch a caſe. Now I ſhall tell you, that *Acids* do operate upon, and alter the Texture of one another; and if ſo, I am ſure that a Diſeaſe caus'd by *Acids* may be cur'd by *Acids*. If the Texture of a Body be alter'd, its Qualities muſt be ſo too, and it muſt act differently from what it did before. All which is plainly ſeen in that very common Experiment in *Chymiſtry*: for if you take good ſtrong *Spirit* of *Nitre*, or *Aqua fortis*, it ſhall immediately diſſolve *Silver*; but if you mix with this *Spirit* of *Nitre*, or *Aqua fortis*, ſome *Spirit* of *Salt*, which is another *Acid* as ſtrong as it ſelf, it ſhall immediatly be ſo alter'd, that it ſhall never be able to diſſolve *Silver* as it did before.

He ſays, the *Doctor's* preparation of *Steel* with *Sal Armoniac* is not made with an *Acid*. I think it is; and to prove it to you, if you make this Preparation in a *Retort* and a ſtrong Fire, you ſhall find nothing but an *Alkali Spirit* to ariſe, and the *Acid* will remain with the *Steel*: for if you take the *Caput Mort.* and diſtil it as other *Acid Spirits* are generally diſtil'd, you ſhall have nothing but a pure *Acid* come over, of great uſe in *Phyſick* and other things.

But to prove it yet further, I ſhall trouble you with an Experiment or two more: If you diſſolve filings of *Steel* in *Spirit* of *Salt*, which is allow'd to be an *Acid*, and diſtil it as before in a *Retort*, you ſhall find the *Caput Mort.* the ſame with that made of *Sal Armoniac*; which I alſo try'd by a *Microſcope*, and found the Texture to be the ſame. And to ſatisfie you yet further that it's not the common *Salt*, but the *Acid Spirit* of it, that is one part of the compound of *Sal Armoniac*, and *Volatile Alkali* the other, you may make a Mixture of *Volatil Alkali* and *Spirit* of *Salt* together, and the produce will be very fine and good *Sal Armoniac*; from which *Sal Armoniac* you may again ſeparate the *Alkali*, and then make the *Doctor*'s Preparation of *Steel*.

The Author of the *Dialogue* is angry with Dr. *Colebatch* for ſaying *Cinnaber* is an *Acid*, but hath not prov'd nor ſaid that it's an *Alkali*. He ſays, a pound of *Cinnaber* will yield thirteen Ounces of running *Mercury*, and that the *Sulphur* which remains is not an *Acid*, but a mixture of *Oil* and *Acid*. I refer it to all the World, whether running *Mercury* will act as *Cinnaber* does: if it does not, than *Cinnaber* does all by virtue of the *Sulphur* embodied with it; which *Sulphur* is an *Acid*, for he allows it to be compounded of an *Acid* and an *Oil* (but not of

an

an *Acid* and *Alkali*) therefore I think it muſt come under the denomination of an *Acid.* And as for *Mercury* being the greateſt Abſorber of *Acids* in the world, I believe it rather an Abſorber of all kind of *Salts* either *Alkali* or *Acid:* it will mix and embody with *Alkalies* as well as *Acids*; it will diſſolve *Metals*; which is an Argument often us'd by the *Author* to prove the *Acidity* of a Body: it will ferment with *Gold*, if well manag'd, and make ſuch a heat as is not to be endur'd by the hand: and I never met with two *Alkalies* that would ferment with one another; but I have often met with two *Acids.*

Page 93. He ſays he will oppoſe one *Alkali* Medicine to all the *Acids* in the world, *viz.* the *Quinteſſence* of *Wine.* I wiſh the *Author* had told us how to make this *Medicine*, that it might be us'd, and judg'd whether it be ſo noble an *Alkali* or not.

But his meaning muſt be gueſt at; ſuppoſe it then to be the fineſt rectifi'd *Spirit* of *Wine*, that cannot be prov'd an *Alkali*, but the contrary: or ſuppoſe it to be a fine *Spirit* or *Eſſence* talkt of by ſome, which is ſo *volatil* and *ſubtil*, that a drop let out of a Bottle, ſhall not reach the ground, but fly away; ſuch an *Eſſence* of *Wine* I have ſeen, and can make at any time, and do affirm that it will come under the denomination of *Acid.*

Page

Page 99. The *Acid Spirit* of Sea *Salt* (our *Author* ſays) will not preſerve Fleſh from Putrefaction. In anſwer to which I ſhall only remind you of what I have already ſaid on that Subject, *viz.* that the *Acid Spirit* of *Salt* will, if diluted in a convenient quantity of an *Aqueous Vehicle*, preſerve Fleſh from Corruption better than common *Salt*; and that common *Salt* may be made much more uſeful in all reſpects, by adding to a ſtrong Solution thereof a proper quantity of *Spirit* of *Salt*.

Page 100. He laughs at Dr *Colebatch* for aſſerting that it's the *Bittern* in *Salt* which excites thirſt; and in oppoſition to him affirms, that *Bittern* is not an *Alkali* but an *Acid*, becauſe *Spirit* of *Salt* is to be obtain'd from it in diſtillation: but he hath not told us in what quantity, for he knew that the proportion was inconſiderable to what remains after diſtillation, there being at leaſt four parts of *Alkali* in *Bittern* to one of *Acid*: which *Alkali* will turn *Syrup* of *Violets* green, and anſwer the Intentions of a very ſtrong *Alkali*. I have known Soap made with it, and that's not to be done without a great quantity of *Alkali*: if *Bittern* be calcin'd as it ought to be, it will then as an *Alkali* do other things, which I ſhall not mention at this time.

Again, tho Spirit of *Salt* may be obtain'd from *Bittern* by diſtillation, yet this will not prove that *Bittern* is an *Acid*, or that the ſaid *Spirit* is any part of the *Bittern*: for it's only ſome remains of the *Acid* part of the *Salt*, becauſe the *Bittern* after diſtillation will exert it ſelf more powerfully in cauſing thirſt, than it will do before it's depriv'd of the *Acid Spirit* of *Salt*; and the ſame *Spirit* taken from *Bittern* will allay thirſt when judiciouſly us'd.

Sir, I am of opinion that our *Author* cannot produce a *Catalogue* of *Medicines* equally efficacious in the cure of Diſeaſes, with *Merc. dulcis*, *Turpeth. Min.* *Red. precipitat.* the natural and artificial *Cinnabers*, *Sal Succini*, *Sal Martis*, *Ens Veneris*, *Ol. Vitrioli*, *Spirit. Nitri*, *Ol. Sulphuris*, and Dr. *Colebatch*'s *Elixir Vitrioli*: all which operate in the Cure of Diſeaſes by virtue of their *Acids*; for if they are diveſted of their *Acid* Particles, they will never be able to produce thoſe effects which with them they perform: and if the uſe of *Alkalies* cannot be thus demonſtrated, I ſhall remain a Proſelyte to the Doctrine of *Acids*.

Thus I have given you my thoughts in anſwer to thoſe Objections that ſeem moſt material in that *Dialogue*; but have purpoſely omitted taking notice of any thing contain'd therein, that has not a relation

relation to *Acids* or *Alkalies* being the Cauſe or Cure of Diſeaſes: and in ſo doing hope that I have anſwer'd your Requeſt, with which, and the repeated Aſſurances of my readineſs to ſerve you,

I take leave to ſubſcribe my ſelf,

SIR,

Yours, &c.

FINIS.